

Base from USGS 7.5' Topo Series: BRAIDENBURG MTN. 1950, 40 ft.; BOMBER CANYON, 1972, 40 ft., and OAK GROVE CANYON, 1972, 40 ft., ARIZONA. Compiled by the Hanto Park Base Map Section. (36-40) (12-77) KRIEGER, M.

SCALE 1:24,000

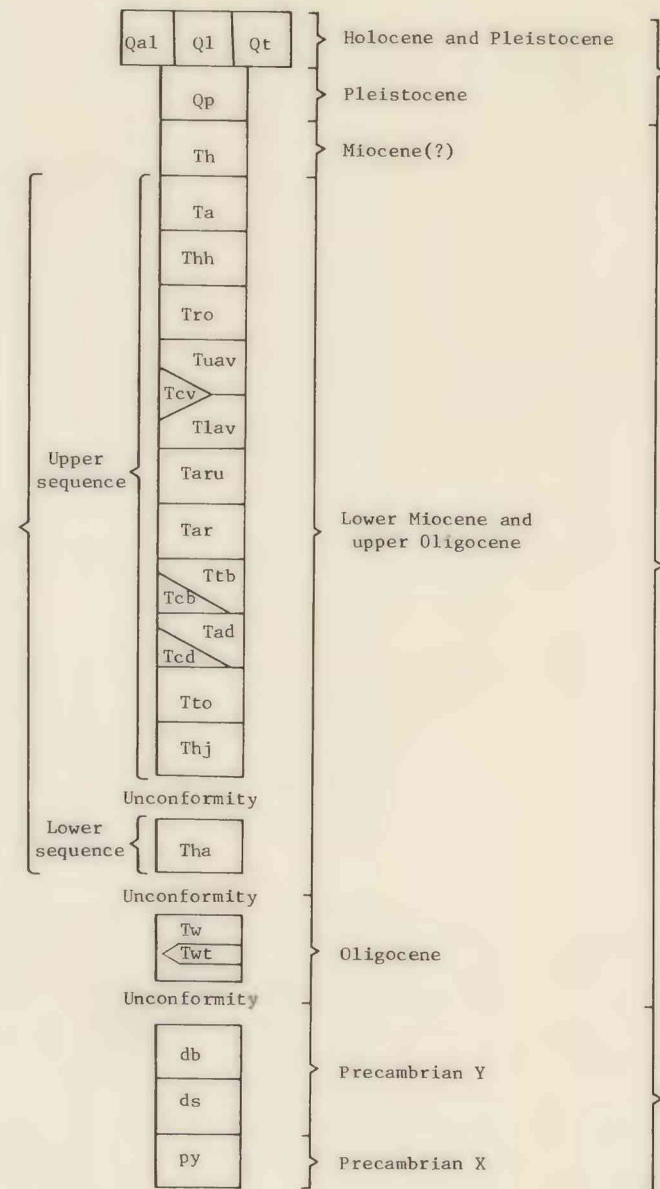
Geology west of 110° 30' from Krieger (1968) with minor corrections; east of 110° 30' from Simons (1964), modified by visual observation and new aerial photographs to fit new topography and to show slightly welded top of Aravaipa Member along Aravaipa Canyon and approximate distribution of units older than Aravaipa Member mapped as lower tuff unit by Simons (1964) in Parsons Canyon and east branch of Virgus Canyon. Geology compiled by M. H. Krieger

135°
TRUE NORTH
APPROXIMATE MEAN
DECLINATION, 1968

110° 30'
27° 30'
110° 25'
SCALE 1:24,000
1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 2 3 4 5 6 7 8 9 10 KILOMETER
CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

CORRELATION OF MAP UNITS



ANDESITE AND CONGLOMERATE OF VIRGUS CANYON

Tuav UPPER ANDESITE (0-30 m thick in western part of area, as much as 60 m in eastern part)—Dark-colored, dense, fine-grained locally amygdaloidal flow with small grains of plagioclase, feldspar, red altered olivine, and sparse clinopyroxene. Some flows have brecciated bases.

Tcv CONGLOMERATE (0-30 m thick, thickest exposures along Aravaipa Canyon between Javalinas and Hooger Canyons)—Pebbles and cobbles derived from lower andesite of Virgus Canyon and older rocks in a sandy matrix. Present locally east of Hooger Canyon, but not mapped separately. Along Whitcomb, Bear Springs, and lower Aravaipa Canyons 0-8 m of unmapped conglomerate composed largely of lower andesite of Virgus Canyon locally separates Aravaipa Member from Hells Half Acre Tuff Member.

Tlav LOWER ANDESITE (0-130 m thick, discontinuous in western part of study area)—Medium-gray to light brownish-gray and reddish-brown, very coarsely porphyritic ("turkey track") olivine andesite; minor amounts of porphyritic to subhaphic andesite. Platylike plagioclase as much as 2 cm long and 0.2 cm thick, small (mostly less than 1 mm) altered olivine and a little clinopyroxene in a groundmass of plagioclase laths, clinopyroxene, altered olivine, apatite, and magnetite or ilmenite. At and west of the south of Fatsano Canyon the upper half of the lower andesite erodes to prominent cliffs showing well-developed columnar jointing.

ARAVAIPA MEMBER

Taru Ash-flow tuff of rhyolite composition that is an exceptional example of an ash-flow with a well-developed interior zonation and a nonwelded distal margin. Interior part of member well-exposed in near-vertical cliffs along Aravaipa, Parsons, and east branch of Virgus Canyons. Nonwelded distal margin, now scallied, exposed between Bear Springs and Cave Canyons. Composed of pumice lapilli, crystal fragments (not abundant) of quartz, feldspar, and biotite, minor foreign rock and mineral fragments, in a shaly matrix, and some rhyolite lapilli in upper part. (75-90 m thick, less than 15 m in distal margin).

Tarv UPPER PARTLY WELDED ZONE (0-30 m thick)—White, soft slope-forming unit with quartz and feldspar the principal devitrification and vapor-phase minerals. Top part, west of Parsons Canyon in the southern part of the study area, is more densely welded than underlying tuff; it probably represents another pulse of the ash flow, one that was hot enough to become more densely welded than underlying tuff. Type of crystallization, however, indicates that it is part of the same cooling unit as the rest of the Aravaipa Member.

Tarv WELDED ZONE (40-75 m thick)—Separated into the following zones (in descending order): Columnar jointed zone, cliff-forming, light brownish-gray, devitrified rock, mostly densely welded (welding increases downward). Groundmass consists of quartz, feldspar, and some cristobalite; coarse-grained vapor-phase crystallization confined to pumice lapilli. Platy jointed zone, densely welded devitrified tuff, with closely spaced subhorizontal joints slightly darker color than columnar jointed zone. Vuggy zone, densely welded and devitrified rock composed largely of cristobalite and feldspar, some quartz and altered biotite; abundant large somewhat flattened vugs or lithophyses, as much as 15 cm in diameter, lined with inward projecting actinolite quartz and locally calcite crystals. A thin vuggy zone within the upper part of the overlying platy jointed zone suggests a second pulse of the ash flow. Vitrophyre, grayish black to brown, densely welded, and glassy. Vitrophyre is exposed along Parsons, east branch of Virgus Canyons, and in Aravaipa Canyon westward from easternmost exposures of the Precambrian porphyry. Basal tuff zone, very light brown, slightly welded in upper part to nearly white and concolled in lower part. Mostly vitric.

TUFF AND CONGLOMERATE OF BEAR SPRINGS CANYON

Ttb TUFF (0-25 m thick)—Rhyolite ash-flow tuff composed of shards, pumice lapilli, crystal and some accidental fragments, and small lithophyses. Lower part is pink tuff largely altered to oligoclite; upper part is light olive-gray to light brownish-gray, columnar-jointed tuff. The member is well exposed in the western and southeastern parts of the area.

Tcb CONGLOMERATE (0-15 m thick)—Composed of older rocks, mostly Paleozoic rocks and older members of the Galluro Volcanics; diabase common in basal part of conglomerate where it underlies the tuff of Bear Springs Canyon, below the tuff.

ANDESITE AND CONGLOMERATE OF DEPRESSION CANYON

Tad ANDESITE (0-40 m thick, mostly less than 10 m, except in western part of study area)—Massive, flow-banded to agglomeratic, gray, brown, and olive andesite; local tuff and breccia beds at base and between flows. Vesicular, nonvesicular or amygdaloidal andesite with a few abundant, small phenocrysts of plagioclase, olivine, altered or partly altered to iddingsite, pyroxene, and magnetite in a groundmass of plagioclase microlites, pyroxene, iddingsite, magnetite, and some K-feldspar.

Tcd CONGLOMERATE (0-15 m thick) composed of older rocks, including older members of the Galluro Volcanics.

Tto TUFF OF OAK SPRINGS CANYON (70 to 150 m thick in eastern part of study area, absent in western part, thin (0-30 m) and discontinuous south of western part of study area). Thicker sections are composed of at least 1 rhyolite tuff units (12-30 m thick, total about 70 m), some of them may be of ash-flow origin, according to Simons (1964, p. 81-82).

Tth HOLY JOE MEMBER (0-10 m thick, thicker sections exposed south of study area)—Quartz-lathite ash-flow tuff, black and brown vitrophyre with abundant crystal fragments (quartz, plagioclase, biotite, sanidine), pumice lapilli, and foreign fragments in a finely welded shaly matrix. In study area, generally contains largely of vitrophyre overlain by 1-2 m of brown devitrified tuff beneath about a meter of vitrophyre at the top. Not encountered in drill hole west of Parsons Canyon where hornblende andesite of Parsons Canyon separates tuff of Oak Springs Canyon from underlying andesite of the lower sequence of the volcanics.

LOWER SEQUENCE

Tth Hornblende andesite of Parsons Canyon (Remnant of a hill at least 50 m high exposed in bottom of Parsons Canyon)—Included by Simons, (1964, p. 82) in his lower tuff unit between tuff of Oak Springs Canyon and Holy Joe Member; now interpreted as probably the top of the lower sequence of the Galluro Volcanics. Massive resistant, light brownish-gray porphyritic flow with well-developed nearly flat flow layering defined particularly by phenocrysts of hornblende. Hornblende phenocrysts as much as 3 mm long, millimeter-sized grains of feldspar, euhedral plagioclase phenocrysts 0.2-1 mm across; groundmass of plagioclase microlites, some interstitial devitrified glass and magnetite.

WHITETAIL CONGLOMERATE

Tv CONGLOMERATE (0-50 m thick)—Composed of pebbles and cobbles of Precambrian rocks, largely porphyry, diabase, and some Paleozoic formations; well indurated.

Twt TUFF (0-8 m thick)—White bed of rhyolite tuff in Whitetail Conglomerate.

PRECAMBRIAN

db DIABASE (0-50 m thick)—Dark-gray to dark greenish-gray or olive-gray, medium-grained diabase, intruded as sills and multiple sills in older Precambrian rocks. Composed of plagioclase, pyroxene, magnetite, ilmenite, and minor olivine; texture is diabasic, ophitic or poikilitic.

ds DRIFTING SPHING QUARTZITE (less than 10 m thick)—Small lenses in diabase sills in southwestern part of study area, feldspathic to arkosic quartzite.

py PORPHYRY (more than 100 m exposed along Aravaipa Canyon)—Massive to foliated, fine-grained porphyritic rock in shades of red, brown and gray. Sparsely to abundant phenocrysts of quartz and plagioclase (1 m to 3 m) and scattered lithic fragments (20 m long or more) in a dense groundmass of quartz, alkalic feldspar, and variable amount of vermicite, some epidote, biotite, and chlorite. Part of map unit may have been of ash-flow tuff origin; part may include some granitic intrusive rocks. Forms massive cliffs in western part of Aravaipa Canyon and upper Cave Canyon. Locally cut by minute quartz veins or by larger gash or lath-like veins of milky quartz.

- Contact
- Fault—long dashed where approximately located, dotted where concealed
- Axis of anticline, dotted where concealed
- Strike of syncline, dotted where concealed
- Strike and dip of beds
- Horizontal beds
- Strike and dip of foliation
- U.S. Geological Survey sample
- U.S. Bureau of Mines sample
- Drill hole

GEOLOGIC MAP SHOWING SAMPLE AND EXPLORATION LOCALITIES IN THE ARAVAIPA CANYON INSTANT STUDY AREA, PINAL AND GRAHAM COUNTIES, ARIZONA
1979